NON-PUBLIC?: N
ACCESSION #: 9307280130
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Haddam Neck PAGE: 1 OF 07

DOCKET NUMBER: 05000213

TITLE: Temporary Loss of Power During Surveillance Testing Due to Blown Fuse
EVENT DATE: 06/26/93 LER #: 93-010-00 REPORT DATE: 07/23/93

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 5 POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Gary H. Tylinski, Senior Engineer TELEPHONE: (203) 267-2556

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: EA COMPONENT: FU MANUFACTURER: X999
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On June 26, 1993, at 1917 hours, with the plant in Mode 5 (Cold Shutdown), a temporary loss of offsite power occurred while Operations personnel were performing a Partial Loss of AC test. Station bus 3 (powering half of the plant) was to remain energized through breaker 3991. When the bus 2 (powering the other half of the plant) supply breaker 3891 was tripped opened, the 3991 breaker also opened resulting in a total loss of normal power. The cause of the trip was traced to the bus 3 Undervoltage Trip and Lockout Scheme where the bus 3 undervoltage relay was found tripped due to a blown fuse. The cause of blown fuse is unknown. Similar usage on other bus undervoltage sensing relays was reviewed for the likelihood of a blown fuse going unnoticed. it was concluded that any other similar situations would have resulted in other indications which would initiate an investigation of the circuit malfunction. The Operator's shift log procedure was revised to cycle the Main Control Board (MCB) 4160 volt meter phase selector switch to check

for blown fuses. This is being reported under 50.73 (a) (2) (iv) since there was an automatic actuation of an Engineered Safety Feature.

END OF ABSTRACT

BACKGROUND

Refer to accompanying sketches.

The 115kV system normally supplies power to the plant 4160V system EIIS Code: EA! by two separate 115kV incoming lines and 115/4.16kV station service transformers (T389 and T399) which are located in the 115kV switchyard EIIS Code: FK!. Also located in the switchyard is a cross-tie Oil Circuit Breaker (OCB) (389T399), which cross-connects the upstream side of the two station service transformers. These transformers supply power to the onsite 4160V system through two separate 4160V buses 2 and 3, via low side output breakers 3891 and 3991 to ensure the availability of station service power. The two emergency safeguard buses EIIS Code: EB! 8 and 9 are normally powered directly from buses 2 and 3 respectively via breakers at each bus. During a loss of offsite power as sensed at the emergency bus level, the emergency buses individually separate from their normal supply and are automatically repowered by their respective emergency diesel generator EIIS Code: EK!. The normal plant configuration is with the 115kV tie breaker, 389T399, closed as well as the station service transformer low side output breakers 3891 and 3991. Normally open circuit breaker 2T3 can cross-connect buses 2 and 3 under abnormal or emergency conditions as necessary such that either or both 115kV lines powers either transformer and both 4160v buses. Buses 1A and 1B power only reactor coolant pumps from offsite power during startup and are later shifted to Unit Station Service Transformer T309.

Potential Transformers (PTs) are used for undervoltage, overvoltage, and ground protection. They also provide the operator with bus voltage indication on the Main Control Board (MCB). The voltmeters on the main control board for buses 2 and 3, with a scale of 0 - 5000 volts, are fed from a four position switch (off,1,2,3) on the main control board which allows selecting the phase voltage monitored by the operator.

The Under Voltage (UV) protection scheme for buses 2 and 3 utilizes a 2 of 2 undervoltage sensing logic for each bus. Individual bus degraded voltage is usually remedied by the closing of the 2T3 breaker or the transfer of an incoming 115 kV line via the 389T399 OCB. In the event that all offsite power is lost, both buses will see an undervoltage

condition and a UV trip and lockout of buses 2 and 3 will occur. The 27Y/1-2 and 27Y/1-3 lockout relays on the auxiliary board will actuate and strip the buses of all loads and prevent the auto start of selected equipment.

There are four undervoltage (UV) relays, two on 4160 volt bus 2 and two on 4160 volt bus 3. These relays are actuated at 70% of normal voltage as seen on the fused output of the bus PTs. In order to initiate an undervoltage trip and lockout on these two buses, it is necessary for both buses to experience an undervoltage condition at the same time. This coincidence feature permits either bus and its equipment to be reenergized from the other via 2T3 on a single 115kV transformer or 115kV incoming line fault, thereby preventing an unnecessary trip and lockout of buses and loads.

EVENT DESCRIPTION

On June 26, 1993, at 1917 hours, with the plant in Mode 5 (Cold Shutdown), a temporary loss of offsite power was experienced.

Operations personnel were performing Procedure SUR 5.1-18, "Test of Train "A" SIAS with a Partial Loss of AC". This test includes an actual trip of the 3891 breaker (normal supply to Bus 2) with tie breaker 2T3 in pull-to-lock to prevent an auto transfer of bus 2 to 3. Bus 3 was to remain energized throughout the test, aligned to the 399 station service transformer through breaker 3991. When the 3891 breaker was tripped opened, the 3991 breaker also opened resulting in a total loss of normal power. The Emergency Diesel Generators started and re-energized their respective buses. The testing was immediately stopped and operators recovered plant equipment and restored power via both 115kV lines and the 389 transformer. The 399 transformer was not returned to service until investigations determined the cause of the 3991 breaker tripping. Core cooling was restored via the Residual Heat Removal system within three minutes, with a rise in reactor coolant system temperature of about 2 degrees F. Spent fuel pool cooling was restored within 40 minutes with a temperature rise of about 4 degrees F.

The cause of the trip was traced to the bus 3 Undervoltage Trip and Lockout Scheme, where the bus 3 undervoltage relay 27B/1-3 was found in the trip position. The 6 Amp fuse in the secondary of the bus 3 potential transformer circuit that supplies undervoltage relay 27B/1-3 was found blown. This condition was not identified prior to commencing the test. When the 3891 breaker was tripped as part of this test, the bus protection scheme described above reacted to a loss of bus 2

coincident with an apparent loss of bus 3. Although this event was unexpected, the scheme functioned as designed for the inputs provided to the circuit while performing this test.

It should be noted that activities and data gathering relative to the T389 and T399 transformer changeout project (within a week prior to this event) confirmed the fuse was intact at that time.

Therefore, this was not a condition which existed during the previous operating cycle.

CAUSE OF THE EVENT

The cause of the blown fuse could not be positively identified.

There had been a significant amount of wiring modifications performed during the refueling outage in the area of the bus 3 protection circuit. A review of the work and interviews with the electricians and technicians performing the work proved inconclusive. This modification activity is most likely the cause of the blown fuse. The fuse had been confirmed functional less than a week earlier.

SAFETY ASSESSMENT

This event is considered reportable under the requirements of 10CFR50.73 (a) (2) (iv), since there was an automatic actuation of an Engineered Safety Feature.

The safety significance of the blown fuse for the undervoltage relay is judged to be low, since this failure alone could not cause a failure of any safety related component. The emergency diesel generators would still be available in the event of a trip and lockout actuation resulting from a partial loss of power on bus 2. Emergency procedures are in place to restore essential cooling to the reactor core and spent fuel pool in the event of a loss of normal power. It should be noted that activities and data gathering relative to the T389/T399 transformer changeout project (within a week prior to this event) confirmed the fuse was intact at that time. Therefore, this was not a condition which existed during the previous operating cycle.

CORRECTIVE ACTION

The blown fuse was replaced. Although the specific cause of the blown fuse could not be established, provisions have been established to identify a blown fuse soon after it occurs. Similar usage on other bus undervoltage sensing relays was reviewed for the likelihood of a blown fuse going unnoticed. All other situations where a blown fuse could cause a trip of a UV relay would also cause other operator discernable abnormal indications. Follow-up troubleshooting activities would then be initiated to find and correct the problem.

The operator shift log procedure (SUR 5.1-0, "Steady State Operational Surveillance") has been revised to periodically cycle the main control board 4160 voltmeter selector switch. Any abnormal phase voltage reading would identify a blown fuse or other circuit component abnormality which would then be investigated and corrected. All such fuses have been verified functional in this manner.

ADDITIONAL INFORMATION

NONE

PREVIOUS SIMILAR EVENTS

NONE

Figure 1 omitted.

Figure 2 omitted.

CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT
362 INJUN HOLLOW ROAD o EAST HAMPTON, CT 06424-3099

July 23, 1993
Re: 10CFR50.73 (a) (2) (iv)

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Reference: Facility Operating License No. DPR-61
Docket No. 50-213
Reportable Occurrence LER 50-213/93-010-00

Gentlemen:

This letter forwards the Licensee Event Report 93-010-00, required to be submitted, pursuant to the requirements of the Haddam Neck Plant's Technical Specifications.

Very truly yours,

John P. Stetz
Vice President

JPS/dl

Attachment: LER 50-213/93-010-00

cc: Mr. Thomas T. Martin
Regional Administrator, Region I
475 Allendale Road
King of Prussia, PA 19406

Mr. William J. Raymond
Sr. Resident Inspector
Haddam Neck

1028-3 REV. 2-91

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